

SECTION 09 30 00

CERAMIC TILE, QUARRY TILE, AND PAVER TILE

08/10

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM C1026	(2010) Standard Test Method for Measuring the Resistance of Ceramic Tile to Freeze-Thaw Cycling
ASTM C1027	(2009) Standard Test Method for Determining Visible Abrasion Resistance of Glazed Ceramic Tile
ASTM C1028	(2007e1) Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method
ASTM C373	(1988; R 2006) Water Absorption, Bulk Density, Apparent Porosity, and Apparent Specific Gravity of Fired Whiteware Products
ASTM C482	(2002; R 2009) Bond Strength of Ceramic Tile to Portland Cement
ASTM C501	(1984; R 2009) Relative Resistance to Wear of Unglazed Ceramic Tile by the Taber Abraser
ASTM C648	(2004; R 2009) Breaking Strength of Ceramic Tile

GREENGUARD ENVIRONMENTAL INSTITUTE (GEI)

GEI	Greenguard Standards for Low Emitting Products
-----	--

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 99	(2012) Health Care Facilities Code
---------	------------------------------------

SCIENTIFIC CERTIFICATION SYSTEMS (SCS)

SCS	Scientific Certification Systems (SCS) Indoor Advantage
-----	---

TILE COUNCIL OF NORTH AMERICA (TCNA)

TCA Hdbk (2010) Handbook for Ceramic Tile
Installation

U.S. GREEN BUILDING COUNCIL (USGBC)

LEED (2009; R 2009) Leadership in Energy and
Environmental Design(tm) Green Building
Rating System for New Construction
(LEED-NC)

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

36 CFR 1191 Americans with Disabilities Act (ADA)
Accessibility Guidelines for Buildings and
Facilities

1.2 SYSTEM DESCRIPTION

1.2.1 General Requirements

Close space, in which tile is being set, to traffic and other work. Keep closed until tile is firmly set. Do not walk or work on newly tiled floors without using kneeling boards or equivalent protection of the tiled surface. Keep traffic off horizontal portland cement mortar installations for at least 72 hours. Keep all traffic off epoxy installed floors for at least 40 hours after grouting, and heavy traffic off for at least 7 days, unless otherwise specifically authorized by manufacturer. For materials like Tile, Accessories, and marble Thresholds submit Samples of sufficient size to show color range, pattern, type and joints.

1.2.2 Local/Regional Materials

Use materials or products extracted, harvested, or recovered, as well as manufactured, within a 500 mile radius from the project site, if available from a minimum of three sources. Submit documentation indicating distance between manufacturing facility and the project site and also the distance of raw material origin from the project site. For Tile and Reinforcing Wire Fabric indicate percentage of post-industrial and post-consumer recycled content per unit of product. Indicate relative dollar value of recycled content products to total dollar value of products included in project. Submit LEED documentation relative to local/regional materials credit in accordance with LEED Reference Guide. Include in LEED Documentation Notebook.

1.2.3 Sustainable Design Certification

Product shall be third party certified by GEI Greenguard Indoor Air Quality Certified, SCS Scientific Certification Systems Indoor Advantage or equal. Certification shall be performed annually and shall be current.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the

following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Local/Regional Materials; (LEED)
Environmental Data
Tile; G, AE
Mortar, Grout, and Adhesive; (LEED)G, AE
Tile; (LEED)
Reinforcing Wire Fabric; (LEED)
Certification

SD-04 Samples

Tile; G, AE

Grout; G, AE

SD-06 Test Reports

Testing; G, AE

SD-07 Certificates

Tile G, AE
Mortar, Grout, and Adhesive; G, AE

SD-11 Closeout Submittals

Local/Regional Materials; (LEED)
Tile; (LEED)
Reinforcing Wire Fabric; (LEED)
Adhesives; (LEED)

1.4 QUALITY ASSURANCE

Dimension and draw detail drawings at a minimum scale of 1/4 inch = 1 foot. Include drawings of pattern at inside corners, outside corners, termination points and location of all equipment items such as thermostats, switch plates, mirrors and toilet accessories mounted on surface. Submit drawings showing ceramic tile pattern elevations floor plans.

1.5 DELIVERY, STORAGE, AND HANDLING

Deliver materials to the project site in manufacturer's original unopened containers with seals unbroken and labels and hallmarks intact. Protect materials from weather, and store them under cover in accordance with manufacturer's printed instructions.

1.6 ENVIRONMENTAL REQUIREMENTS

Do not perform ceramic tile work unless the substrate and ambient temperature is at least 50 degrees F and rising. Maintain temperature above 50 degrees F while the work is being performed and for at least 7 days after completion of the work. When temporary heaters are used, ventilate the area to the outside to avoid carbon dioxide damage to new tilework.

1.7 WARRANTY

Provide manufacturer's standard performance guarantees or warranties that extend beyond a 1-year period.

1.8 EXTRA MATERIALS

Supply an extra two percent of each type tile used in clean and marked cartons.

PART 2 PRODUCTS

2.1 TILE

Conform to TCA Hdbk for standard grade tile. Provide grade sealed containers. Mark seals with the marks on the signed master grade certificate. Provide an impact resistant tile with a minimum floor breaking strength for wall tile of 90 pound and for floor tile of 250 pound in accordance with ASTM C648. The manufacturer will provide a frost resistant rating for tile used in cold climate projects as determined by ASTM C1026. Provide a 0.50 maximum percent water absorption in accordance with ASTM C373. Provide a minimum coefficient of friction of 0.60 wet and dry in accordance with ASTM C1028. Identify floor tile as Class III-Medium Heavy Traffic, durability classification as rated by the manufacturer when tested in accordance with ASTM C1027 for abrasion resistance as related to foot traffic. Coordinate the color with the Finish Schedule in the drawing set. Tile may contain post-consumer or post-industrial recycled content. Submit manufacturer's catalog data and preprinted installation and cleaning instructions plus a master grade certificate for tile. Indicate VOC content.

2.1.1 Porcelain Tile

Furnish an unglazed porcelain tile and trim with the color extending uniformly through the body of the tile. Porcelain tile shall contain a minimum of 6.5 percent PRE-CONSUMER recycled content. Provide a nominal size of 12 by 24 by 3/8 inch thick. Criteria for tile to meet or exceed is as follows: Abrasive wear in accordance with ASTM C501 and bonding strength in accordance with ASTM C482. Comply with 36 CFR 1191 for coefficient of friction for interior tiled floors. Use Dal-tile Product, Kimona Silk in Water Chestnut and Colour Scheme in Artic White for the Basis of Design. Coordinate color with the Finish Schedule in the drawing set.

2.2 WATER

Provide potable water.

2.3 MORTAR, GROUT, AND ADHESIVE

Submit certificates indicating conformance with specified requirements. Submit LEED documentation relative to low-emitting materials credit in accordance with LEED Reference Guide. Include in LEED Documentation Notebook. Interior adhesives, sealants, primers and sealants used as filler must meet the requirements of LEED low emitting materials credit. Conform to the following for mortar, grout, adhesive, and sealant:

2.3.1 Dry-Set Portland Cement Mortar

TCA Hdbk. Zero-volatile organic compound (VOC) content.

2.3.2 Latex-Portland Cement Mortar

TCA Hdbk. Zero-VOC content.

2.3.3 Ceramic Tile Grout

TCA Hdbk; petroleum-free and plastic-free sand portland cement grout commercial portland cement grout. Maximum VOC content of 150 grams/liter.

2.3.4 Moisture Resistant Gypsum Board

Provide cementitious backer units, for use as tile substrate over wood sub-floors, in accordance with TCA Hdbk. Furnish 1/2inch thick moisture resistant gypsum board units.

PART 3 EXECUTION

3.1 PREPARATORY WORK AND WORKMANSHIP

Inspect surface to receive tile in conformance to the requirements of TCA Hdbk for surface conditions for the type setting bed specified and for workmanship. Provide variations of tiled surfaces that fall within maximum values shown below:

TYPE	WALLS	FLOORS
Dry-Set Mortar	1/8 inch in 8 ft.	1/8 inch in 10 ft.
Latex Portland Cement Mortar	1/8 inch in 8 ft.	1/8 inch in 10 ft.

3.2 GENERAL INSTALLATION REQUIREMENTS

Do not start tile work until roughing in for mechanical and electrical work has been completed and tested, and built-in items requiring membrane waterproofing have been installed and tested. Do not start floor tile installation in spaces requiring wall tile until after wall tile has been installed. Apply tile in colors and patterns indicated in the area shown on the drawings. Install tile with the respective surfaces in true even planes to the elevations and grades shown. Provide special shapes as required for sills, jambs, recesses, offsets, external corners, and other conditions to provide a complete and neatly finished installation. Solidly back tile bases and coves with mortar.

3.3 INSTALLATION OF WALL TILE

Install wall tile in accordance with the TCA Hdbk.

3.3.1 Dry-Set Mortar and Latex-Portland Cement Mortar

Use Latex-Portland Cement to install tile in accordance with TCA Hdbk. Use Latex Portland Cement when installing porcelain ceramic tile.

3.4 INSTALLATION OF FLOOR TILE

Install floor tile in accordance with TCA Hdbk method. Install over interior concrete substrates, install in accordance with TCA Handbook Method F113, dryset or latex-Portland cement bond coat, with standard grout, unless otherwise indicated. Where waterproof membrane is indicated, install in accordance with TCA Handbook Method F122, with Latex Portland Cement Grout.

3.4.1 Workable or Cured Mortar Bed

Install floor tile over a workable mortar bed or a cured mortar bed at the option of the Contractor. Conform to TCA Hdbk for workable mortar bed materials and installation. Conform to TCA Hdbk for cured mortar bed materials and installation. Provide minimum 1/4 inch to maximum 3/8 inch joints in uniformed width.

3.4.2 Dry-Set and Latex-Portland Cement

Use dry-set or Latex-Portland cement mortar to install tile directly over properly cured, plane, clean concrete slabs in accordance with TCA Hdbk. Use Latex Portland cement when installing porcelain ceramic tile.

3.4.3 Ceramic Tile Grout

Prepare and install ceramic tile grout in accordance with TCA Hdbk.

3.5 TESTING

Perform electrical resistance tests on conductive flooring, in the presence of the Contracting Officer, by a technician experienced in such work. Furnish a copy of the test results. Provide test procedures, testing apparatus, and test results in accordance with the provisions for Conductive Flooring in NFPA 99.

3.6 EXPANSION JOINTS

Form and seal joints as specified in Section 07 92 00 JOINT SEALANTS.

3.6.1 Walls

Provide expansion joints at control joints in backing material. Wherever backing material changes, install an expansion joint to separate the different materials.

3.6.2 Floors

Provide expansion joints over construction joints, control joints, and expansion joints in concrete slabs. Provide expansion joints where tile abuts restraining surfaces such as perimeter walls, curbs and columns and at intervals of 24 to 36 feet each way in large interior floor areas and 12 to 16 feet each way in large exterior areas or areas exposed to direct sunlight or moisture. Extend expansion joints through setting-beds and fill.

3.7 CLEANING AND PROTECTING

Upon completion, thoroughly clean tile surfaces in accordance with manufacturer's approved cleaning instructions. Do not use acid for cleaning glazed tile. Clean floor tile with resinous grout or with factory mixed grout in accordance with printed instructions of the grout manufacturer. Do not permit traffic over finished floor surface for 72 hours after installation. After the grout has set, provide a protective coat of a noncorrosive soap or other approved method of protection for tile wall surfaces. Cover tiled floor areas with building paper before foot traffic is permitted over the finished tile floors. Provide board walkways on tiled floors that are to be continuously used as passageways by workmen. Replace damaged or defective tiles.

3.8 WASTE MANAGEMENT

Separate waste, including metal and cardboard, in accordance with the Waste Management Plan and recycle or reuse. Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in designated containers and areas. Close and seal tightly partly used sealant and adhesive containers and store in protected, well-ventilated, fire-safe area at moderate temperature. Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in designated containers and areas and dispose of properly. Set aside and protect half-tile and larger offcuts and remainders for reuse. Crush broken tile, offcuts smaller than a half tile, and excess mortar and grout for use as mosaic, sub-base, or fill. Identify manufacturer's policy for collection or return of construction scrap, unused material, demolition scrap, and packaging material. Institute recycling to take advantage of manufacturer's programs. When such a service is not available, seek local recyclers to reclaim the materials.

-- End of Section --